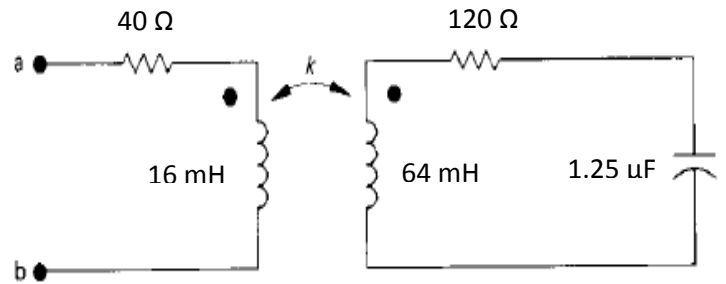


Sheet 5

1.

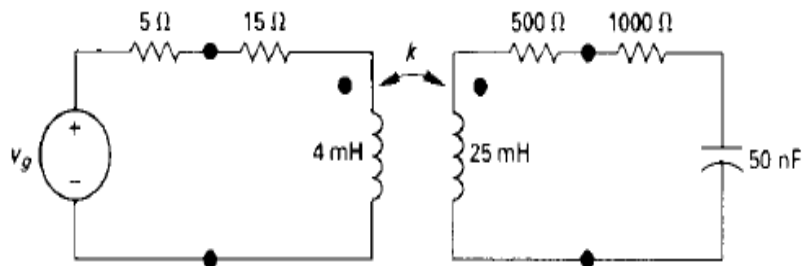
The value of k in the circuit in Fig. P.1 is adjusted so that Z_{ab} is purely resistive when $\omega = 5 \text{ krad/s}$. Find Z_{ab} .



2.

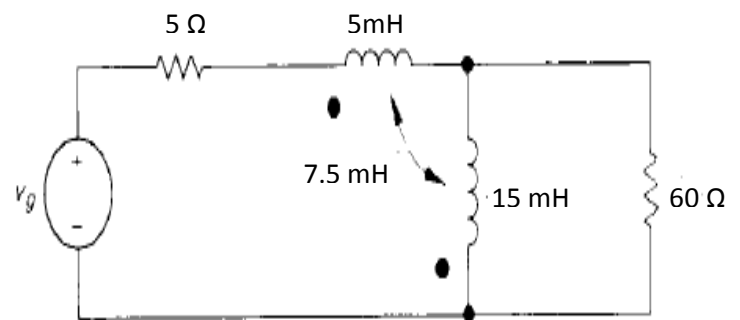
The sinusoidal voltage source in the circuit seen in Fig. P.2 is operating at a frequency of 40 krad/s . The coefficient of coupling is adjusted until the peak amplitude of i_1 is maximum.

- What is the value of k ?
- What is the peak amplitude of i_1 if $v_g = 500 \cos(4 \times 10^4 t) \text{ V}$?



3.

Find the average power delivered to the 60Ω resistor in the circuit shown in Fig. P.3 if $v_g = 150 \cos 4000t \text{ V}$

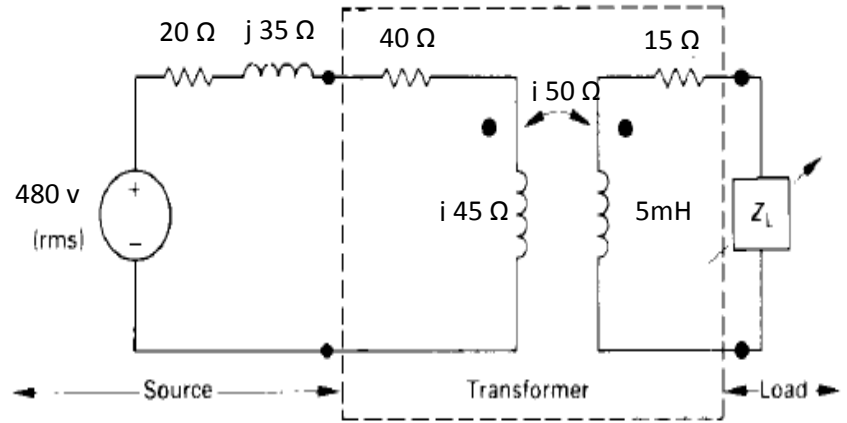


4.

The impedance Z_L in the circuit in Fig.

P.4 is adjusted for maximum average power transfer to Z_L . The internal impedance of the sinusoidal voltage source is $20 + j35 \Omega$

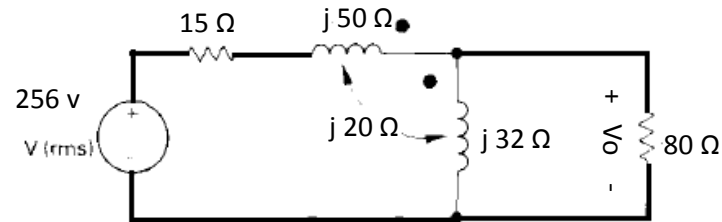
- What is the maximum average power delivered to Z_L ?
- What percentage of the average power delivered to the linear transformer is delivered to Z_L ?



5.

For the phasor-domain circuit in Fig. P.5 calculate:

- the rms magnitude of V_o ;
- the average power dissipated in the 80Ω resistor; and
- the percentage of the average power generated by the ideal voltage source that is delivered to the 80Ω resistor.



6.

Find Z_{ab} in the circuit in Fig. P13.20.

